

INSTRUCTION SETS FOR PROCESSORS

[ABSTRACT OF THE DISCLOSURE]

5 A processor has respective first and second  
external instruction formats ( $F_1$ ,  $F_2$ ) in which  
instructions (add, load) are received by the processor.  
Each instruction has an opcode (e.g. 1011) which  
specifies an operation to be executed. Each external  
format has one or more preselected opcode bits ( $F_1$ :  
10  $i+1 \sim i+4$ ;  $F_2$ :  $i+1 \sim i+3$ ) in which the opcode appears. The  
processor also has an internal instruction format ( $G_1$ )  
into which instructions in the external formats are  
translated prior to execution of the operation.

15 A first operation (add) is specifiable in both the  
first and second external formats ( $F_1$ ,  $F_2$ ), and a second  
operation (load) is specifiable in the second external  
format ( $F_2$ ). The first and second operations have  
distinct opcodes (101, 011) in the second external  
format. In each of the preselected opcode bits which  
20 the first and second external formats have in common  
( $i+1 \sim i+3$ ), the opcodes of the first operation (101) in  
the two external formats are identical.

Such "congruent" instruction encodings can enable  
a translation process, for translating the external-  
25 format opcode into a corresponding internal-format  
opcode, to be carried out simply and quickly without  
the need to positively identify each individual  
external-format opcode.

30 [Fig. 3(B)]